

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Patent Application No. 09/931,564

REMARKS

Reconsideration and allowance of the subject application are respectfully requested. Upon entry of this Amendment, claims 1-8 are pending in the application. In response to the Office Action (Paper No. 2), Applicant respectfully submits that the pending claims define patentable subject matter. By this Amendment, Applicant has amended claims 1 and 2 in order to improve clarity.

As a preliminary matter, Applicant notes that the Examiner did not acknowledge receipt of the priority documents and the claim for foreign priority under 35 U.S.C. § 119. Accordingly, Applicant requests that the Examiner acknowledge receipt of the priority documents and the claim for foreign priority under 35 U.S.C. § 119 in the next action.

Claims 1-3 and 5-8 are rejected under 35 U.S.C. § 102(b) as anticipated by Daikoku et al. (U.S. Patent No. 6,075,305; hereafter “Daikoku”). Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Daikoku. Applicant respectfully traverses the prior art rejections.

Independent claim 1 recites in part “an armature comprising a winding including a plurality of coil portions each formed by lap-winding a conductor between a corresponding pair of slots formed in an outer circumferential surface portion of a core fixed to said shaft in such a way as to extend in an axial direction thereof; [and] a commutator ... including a plurality of segments to which lead parts of both end sections of said coil portions are electrically connected.” Claim 1 further recites “said coil portions are disposed in such a manner as to be symmetrical with respect to a mechanical angle of 360 degrees, wherein lead parts of said coil

portions other than one of said coil portions, which is nearest in a circumferential direction to each of said segments, are drawn therefrom in a same circumferential direction.”

Independent claim 2 recites in part “an armature comprising a winding including a plurality of coil portions formed by lap-winding and wave-winding a conductor between each pair of slots formed in an outer circumferential surface portion of a core fixed to said shaft in such a way as to extend in an axial direction thereof; [and] a commutator ...including a plurality of segments to which lead parts of both end sections of said lap-wound and wave-wound coil portions are electrically connected.” Claim 2 further recites “said lap-wound coil portion and said wave-wound coil portion, the respective of which have lead parts to be connected to a same one of the segments, are disposed in such a manner as to be symmetrical with respect to a mechanical angle of 360 degrees, and wherein both lead parts of said wave-wound coil portions are drawn therefrom in a same circumferential direction.”

Applicant respectfully submits that it is quite clear that the Daikoku does not teach or suggest that the lead parts of coil portions of the armature winding are drawn therefrom in a same circumferential direction, as required by claims 1 and 2. For example, differently from the conventional motor shown in Figure 13 in which lead parts 115B of the lower-side portion 114 at the lower side of the armature 105 intersect each other, the present invention shown in Figure 3 teaches the lead parts 5B at both end sections of the lower-side coil portion 4 are drawn out therefrom in the same direction and do not intersect each other. As a result, the operation of winding the conductors so as to manufacture the winding is facilitated and an occurrence of defective insulation is prevented.

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Daikoku discloses a dynamo-electric machine comprising an armature, a commutator assembly, and equalizers electrically connecting portions of armature circuits comprising an armature coil, commutator segments and risers of disposed on end portions of the commutator segments which are to have the same electric potential. Applicant submits that it is quite clear that Daikoku does not teach or suggest coil ends having lead parts drawn out and connected to the segments in the manner claimed. Although the Examiner refers to Figures 1, 2, 4 and 6 of Daikoku for teaching this feature of the claimed invention, only Figure 1 shows the armature coil (5) and does not show how the armature coil is wound or connected to the segments of the commutator. Moreover, Applicant submits that nowhere does Daikoku discuss in any manner the how the armature coil is wound or connected to the segments of the commutator

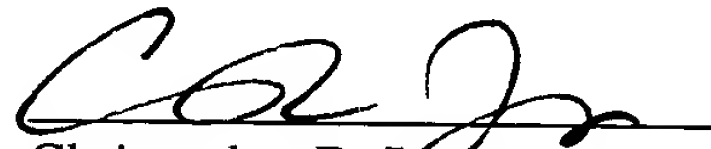
Accordingly, Applicant respectfully submits that independent claims 1 and 2, as well as dependent claims 2-8, should be allowable because the cited reference does not teach or suggest all of the features of the claims.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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PATENT TRADEMARK OFFICE

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IN THE SPECIFICATION:

Page 2, first full paragraph, please replace as follows:

FIGS. 12 and 13 are developed plan winding diagrams each illustrating the cylindrical arrangement of the winding 111, the magnetic poles 102, the ~~communicator~~ commutator 106, and the brushes 108 in the direction of rotation so as to explain the positional relation among the mounting positions of these members.

Page 3, second full paragraph, please replace as follows:

Incidentally, in the case of each of the coil portions 114 indicated by dotted lines in FIG. 14, each of the brushes 108 is brought into abutting engagement with two of the segment 112, as shown in FIG. 15. Thus, these segments are at equal electric potential. Consequently, the dotted lines indicate that no current flows through the corresponding ~~wiring~~ wiring portion 114.

Please delete the paragraph bridging pages 8 and 9 as follows:

FIGS. 2 and 3 are developed plan winding diagrams each illustrating the cylindrical arrangement of the winding 3, the magnetic poles 102, the ~~communicator~~ commutator 106, and the brushes 108 in the direction of rotation so as to explain the positional relation among the mounting positions of these members.

IN THE CLAIMS:

Please amend and/or add the following claims:

1. (Currently Amended) A dynamo-electric machine comprising:

a yoke;

magnetic poles fixed in said yoke;

a shaft rotatably provided in said yoke;

an armature ~~having~~ comprising a winding ~~consisting of~~ including a plurality of coil portions each formed by lap-winding a conductor between a corresponding pair of slots formed in an outer circumferential surface portion of a core fixed to said shaft in such a way as to extend in an axial direction thereof;

a commutator fixed to an end portion of said shaft and ~~having~~ comprising a plurality of segments to which lead parts of both end sections of said coil portions are electrically connected; and

brushes made to respectively abut against the surfaces of said segments of said commutator,

wherein n ~~(incidentally, "n" is a common divisor of the number of the magnetic poles and the number of the slots and equal to or more than 2)~~ of said coil portions are parallel-connected between said segments, where n is a common divisor of the number of the magnetic poles and the number of the slots and equal to or more than 2,

wherein said coil portions are disposed in such a manner as to be symmetrical with respect to a mechanical angle of 360 degrees, wherein said lead parts of said coil portions other

than one of said coil portions, which is nearest in a circumferential direction to each of said segments, are drawn therefrom in a same circumferential direction for electrical connection to said segments.

2. (Currently Amended) A dynamo-electric machine comprising:

a shaft;

an armature ~~having~~ comprising a winding ~~consisting of~~ including a plurality of coil portions formed by lap-winding and wave-winding a conductor between each pair of slots formed in an outer circumferential surface portion of a core fixed to said shaft in such a way as to extend in an axial direction thereof;

a commutator fixed to an end portion of said shaft and ~~having~~ comprising a plurality of segments to which lead parts of both end sections of said lap-wound and wave-wound coil portions are electrically connected; and

brushes made to respectively abut against the surfaces of said segments of said commutator,

wherein said lap-wound coil portion and said wave-wound coil portion, the respective of which have said lead parts to be connected to a same one of the segments, are disposed in such a manner as to be symmetrical with respect to a mechanical angle of 360 degrees, and wherein both of said lead parts of said wave-wound coil portions are drawn therefrom in a same circumferential direction for electrical connection to said segments.

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3. (Original) A dynamo-electric machine according to claim 1, each of said coil portions comprises a plurality of small coil portions parallel-connected to one another.

4. (Original) A dynamo-electric machine according to claim 1, wherein the number of the slots and the number of the segments are 22, wherein the number of poles is 4, and wherein two of the coil portions are parallel-connected between each pair of said segments.

5. (Currently Amended) A dynamo-electric machine according to claim 1, ~~which~~ further ~~comprises~~ comprising an equalizer connecting said segments that are to be at equal electric potential.

6. (Original) A dynamo-electric machine according to claim 5, wherein said conductor and said equalizer are constituted by members made of a same material, and wherein said winding and said equalizer are continuously connected to each other.

7. (Currently Amended) A dynamo-electric machine according to claim 1, wherein said conductor ~~is~~ comprises an enamel-coated round wire.

8. (Currently Amended) A dynamo-electric machine according to claim 1, ~~which~~ wherein said dynamo-electric machine is a motor for use in an electric power steering system.